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TI Electronic excitations and luminescence in MgO:Ge single crystals

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AB MgO single crystals, doped with Ge²⁺ 'mercury-like' ions, were grown. The emission of Ge²⁺ centers (<3.2 eV) can be efficiently excited at 4s2 4s4p electron transitions in Ge²⁺ ions (4.8-6.4 eV) as well as at the formation of electron-hole (e-h) pairs by 8-36 eV photons. The absorption of one photon of 25 or 30 eV leads to the creation of two or three e-h pairs, resp. The thermal quenching of the emission begins at <500 K and follows the Mott law with an activation energy E = 0.52 eV. Taking advantage of the relatively high thermal stability of Ge²⁺ luminescence, high temp. thermostimulated luminescence (up to 775 K) of MgO:Ge crystals was studied.

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